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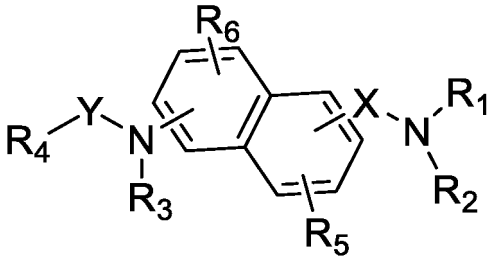
(54) **DRUG FOR TREATING TUMOR DISEASES, AND HAVING ANTIBACTERIAL, ANTIVIRUS AND ANTI-INFLAMMATORY EFFECTS**

(57) A drug for treating tumor diseases, and having antibacterial, antivirus, and anti-inflammatory effects. The drug contains a naphthalene dicarboxamide compound having a structural formula as shown in Formula I or a biologically acceptable salt or the compound with the formula I as an active ingredient. The drug for treating tumor diseases, and having antibacterial, antivirus, and anti-inflammatory effects has a good effect on inhibiting the growth of tumor cells, and also has certain antibacterial, antivirus, and anti-inflammatory effects.



Formula I

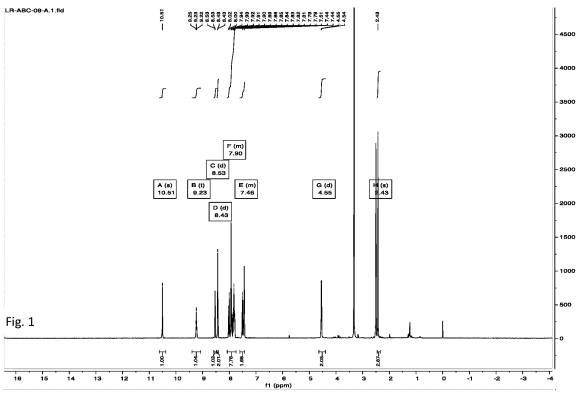


Fig. 1

EP 3 669 869 A1

Description

FIELD

[0001] The present disclosure is in the field of biomedicine, chemistry, medicine, microbiology, and drug production, especially for tumor and cancer treatment.

BACKGROUND

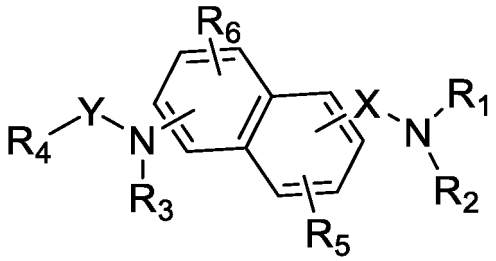
[0002] With the fast pace of modern society and high pressure in daily work, many people are suffering in a suboptimal health status (SHS). An insufficiency of autoimmunity leads to increasing incidences of various diseases, which seriously threaten people's lives. Since the 20th century, organic chemical synthesis has played a vital role for novel small molecules discoveries to treat various diseases due to their unique spatial stereo structure, electronic distribution, and spatial arrangement of active groups.

[0003] Naphthalene diamides are based on naphthalene rings as a parent nucleus, connecting with two amide bonds. It can interact electrically with enzymes and receptors related to cancer in organisms through the interaction of amides and electron-rich groups. Meanwhile, aromatic rings in the structure can stack with enzymes and receptors to inhibit the occurrence of cancer.

SUMMARY

[0004] The present disclosure describes a naphthalene diamide compound comprising a structure expressed by the following structural formula, a synthesis method of preparing the compound, and in vitro anti-tumor cell activity screening studies.

[0005] In another aspect, the present disclosure describes a pharmaceutical compound or composition for treatment of cancer and a drug containing the naphthalene dicarboxamide compound with the structural formula as shown below or a biologically acceptable salt or ester with said compound as an active ingredient. The anti-cancer drug is able to inhibit the growth of tumor cells and has certain antibacterial, antiviral, and anti-inflammatory effects.



BRIEF DESCRIPTION OF THE DRAWINGS

[0006]

Fig. 1 illustrates an ABC-09 nuclear magnetic resonance spectrum of the compound and/or drug of the present disclosure.

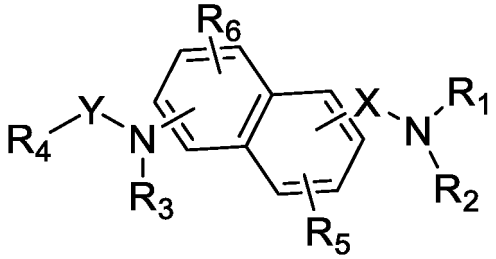
Fig. 2 illustrates an ABC-46 nuclear magnetic resonance spectrum of the compound and/or drug of the present disclosure.

DETAILED DESCRIPTION

[0007] The present disclosure provides a naphthalene diamide compound with a structure expressed by Formula I, a synthesis method of preparing the compound, and in vitro anti-tumor cell activity screening studies.

[0008] In another aspect, the present disclosure describes a pharmaceutical compound or composition for treatment of cancer and a drug containing a naphthalene dicarboxamide compound with a structural formula as shown below or a biologically acceptable salt or ester with said compound as an active ingredient.

[0009] To achieve the above goals, the present disclosure provides the following technical solutions:
a naphthalene diamide based chemical structure as shown in Formula I,



Formula I

where X and Y can be separately selected from carbonyl, thiocarbonyl, and sulfonyl groups. R_1, R_2 together with adjacent nitrogen atoms can form a ring of 3 to 12 atoms or a ring structure substituted by a substituent M.

[0010] Alternatively, R_1 and R_2 can be independently selected from hydrogen, C_{1-12} alkyl, C_{1-12} alkoxy, C_{3-7} cycloalkyl, C_{1-12} alkoxycarbonyl, C_{1-12} alkylcarbonyl, aminocarbonyl, C_{1-12} alkylaminocarbonyl, nitro, oxazoly, thiazoly, pyridyl, pyridine, dihydropyridyl, tetrahydropyridyl, piperidinyl, thiazinyl, pyrrolyl, imidazolyl, pyrazolyl, pyrimidinyl, piperaziny, morpholinyl, furanyl, pyranyl, and other heterocyclic groups. They can also be independently selected from the above-mentioned groups, aryl groups, benzyl groups, aryl hydrocarbon group, and heteroaryl hydrocarbon group, which are selectively replaced by substituted group M. When R_1 and R_2 are replaced by substituent M, the number of substituent M can be single or multiple. If the substituents M are multiple, they are not relevant to each other, or they form a ring structure. If two substituents M form a ring structure and the linked group substituted by substituent M is also a ring structure, they may or may not form a heterocyclic ring structure.

[0011] Substitute M can be hydrogen, fluorine, chlorine, bromine, iodine, cyano, nitro, hydroxyl, amino, C_{1-12} alkyl, halogenated C_{1-12} alkyl, perfluoro-C_{1-12} alkyl, polyhalogenated C_{1-6} alkyl, aryl, substituted aryl, C_{1-12} alkylamino, C_{3-12} cycloalkylamino, di(C_{1-12} alkyl)amino, C_{3-12} cycloalkyl, and substituted C_{3-12} cycloalkyl.

[0012] The aryl hydrocarbon group substituted by the substituent M is a halogenated halophenyl hydrocarbon, alkoxyalkyl, perfluoroalkylphenyl hydrocarbon, hydrocarbyl-substituted phenyl hydrocarbon, nitro-substituted phenyl hydrocarbon, or hydroxyl-substituted phenylhydrocarbyl.

[0013] The heteroaryl hydrocarbon group substituted by substituent M includes halogenated pyridine hydrocarbon group, halogenated furan hydrocarbon group, halogenated thiazolidine, halogenated pyrimidine hydrocarbyl, halogenated imidazolium, nitro-substituted pyridine hydrocarbon, nitro-substituted furanyl, nitro-substituted thiazolidine, nitro-substituted pyrimidine hydrocarbyl, nitro-substituted imidazolium, amino-substituted pyridine hydrocarbon group, amino-substituted furan hydrocarbyl, amino substituted thiazolyl, amino substituted pyrimidine hydrocarbyl, and amino substituted imidazolium.

[0014] R_3 can be selected from hydrogen, fluorine, chlorine, bromine, iodine, nitro, amino, C_{1-3} alkyl, C_{1-3} alkoxy, C_{3-7} cycloalkyl, halogen substituted C_{3-7} cycloalkyl, halogenated C_{1-12} alkyl, C_{2-12} alkenyl, hydroxyl-substituted C_{1-12} alkyl, C_{1-12} alkoxy, C_{1-12} alkoxycarbonyl, aminocarbonyl, C_{1-6} alkylaminocarbonyl, Di(C_{1-12} alkyl)aminocarbonyl, C_{3-7} cycloalkylaminocarbonyl, C_{3-7} cycloalkoxy, hydroxy-C_{1-12} alkoxy, halogenated C_{1-12} alkoxy, amino C_{1-12} alkyl, amino C_{1-12} alkoxy, C_{1-12} alkyl sulfone, C_{2-12} alkenyl sulfone, C_{3-7} cycloalkyl sulfone, heterocyclic oxy, amino-substituted piperidinyl, N-methylpiperidin-4-carbonyl, piperazine-C_{1-12} alkyl, formamide, and N-methyl piperidine carboxamide.

[0015] R_4 can be selected from hydrogen, C_{1-12} alkyl, C_{1-12} alkoxy, C_{3-7} cycloalkyl, halogen substituted C_{3-7} cycloalkyl, C_{1-6} alkoxycarbonyl, C_{1-12} alkylcarbonyl, aminocarbonyl, C_{1-12} alkylaminocarbonyl, nitro, amino, C_{1-3} alkyl substituted amino, Di(C_{1-3} alkyl) substituted amino, oxazolyl, thiazolyl, pyridyl, dihydropyridyl, tetrahydropyridyl, piperidinyl, thiazinyl, pyrrolyl, imidazolyl, pyrazolyl, pyrimidinyl, piperazinyl, morpholinyl, furanyl, pyranyl, and other heterocyclic groups. The following groups can optionally be substituted by a substituent Q: an aryl group, a benzyl group, a heteroaryl group, an arylalkyl group, and a heteroaryl hydrocarbon group. The substituent Q can be double and multiple groups independently, which form ring structures via molecular interconnections.

[0016] When each substituent Q is an independent substituent, each substituent Q can be separately selected from hydrogen, fluorine, chlorine, bromine, iodine, cyano, nitro, hydroxyl, amino, C_{1-12} alkyl, halogenated C_{1-12} alkyl, perfluoro-C_{1-12} alkyl, polyhalogenated C_{1-12} alkyl, C_{1-12} alkoxy, halogenated C_{1-12} alkoxy, aryl, substituted aryl, C_{1-12} alkylamino, C_{3-7} cycloalkylamino, Di(C_{1-12} alkyl)amino, C_{3-7} cycloalkyl, and substituted C_{3-7} cycloalkyl.

[0017] The numbers of R_5 and R_6 range from 0 to 6 while the optimal number is 0-3 or 0-2. If there are more than two R_5 and R_6, they are independent of each other.

[0018] R_5 and R_6 are separately selected from hydrogen, fluorine, chlorine, bromine, iodine, cyano, nitro, hydroxyl, hydroxyl, C_{1-12} alkyl, C_{1-12} alkoxy, C_{3-7} cycloalkyl, halogenated C_{1-12} alkyl, C_{2-12} alkenyl, hydroxyl-substituted C_{1-12} alkyl, C_{1-12} alkylamino, C_{3-7} cycloalkylamino, Di(C_{1-12} alkyl)amino, amino-C_{1-12} alkylamino, C_{1-12} alkoxy, C_{1-12} alkylamino, C_{1-12} alkoxycarbonyl, Di(C_{1-12} alkoxy-C_{1-12} alkyl) amino, aminocarbonyl, C_{1-12} alkylaminocarbonyl, Di(C_{1-12}

alkyl)aminocarbonyl, C_{3-7} cycloalkylaminocarbonyl, C_{3-7} cycloalkoxy, halogenated C_{1-12} alkoxy, amino C_{1-12} alkyl, amino C_{1-12} alkyl, C_{1-12} alkyl sulfone, C_{2-12} alkenyl sulfone, C_{3-7} cycloalkyl sulfone, halogenated C_{3-7} cycloalkyl, heterocyclic oxy, piperidinylamino, N-methylpiperidin-4-carbonyl, piperazine-C_{1-6} alkyl, formamide, and N-methyl piperidine carboxamide.

[0019] Further, X could be carbonyl, thiocarbonyl, or sulfonyl. Carbonyl is preferred.

[0020] Further, Y could be carbonyl, thiocarbonyl, or sulfonyl. Carbonyl is preferred.

[0021] Further, X substituents are in the β position of the naphthalene ring and N substituents (connected to Y, shown in Formula 1) are in the non-substituted *para*- position of the naphthalene ring. For example, if X is substituted at the 2-position, then Y-connected N is substituted at the 6-position. If X is substituted at the 3-position, then Y-connected N substituted at the 7-position. Numbered from the carbon next to the two symmetric carbon (the two carbons in the middle are not numbered), the carbons of 1, 4, 5, and 8 are the same (called α carbon, or α-position), while the carbons of 2,3, 6, 7 are the same (called β carbon, or β-position).

[0022] Further, R_1 and R_2 together with the adjacent nitrogen atom can form a pyrrole ring, tetrahydropyrrole ring, pyridine ring, tetrahydropyridine ring, piperidine ring, piperazine ring, oxazine ring, tetrahydrooxazide ring, morpholine ring. The ring structure formed above can be substituted by C_{1-6} alkyl, substituted C_{1-6} hydrocarbyl substitution, halogenated C_{1-3} hydrocarbon group substitution.

[0023] Further, R_1 and R_2 can be independently selected from hydrogen, C_{1-6} alkyl, C_{1-6} alkoxy, cyclopropane, cyclohexane, C_{1-4} alkoxycarbonyl, C_{1-4} alkylcarbonyl, aminocarbonyl, C_{1-4} alkylaminocarbonyl, nitro, oxazolyl, oxazolyl, pyridyl, dihydropyridyl, tetrahydropyridyl, piperidinyl, thiazinyl, pyrrolyl, imidazolyl, pyrimidinyl, piperazinyl, pyrazolyl, morpholinyl, furanyl, pyranyl, phenyl, C_{1-4} alkyl substituted phenyl, and Di(C_{1-4} alkyl) substituted phenyl.

[0024] Further, R_3 can be selected from hydrogen, fluorine, chlorine, bromine, iodine, nitro, amino, methyl, ethyl, propyl, isopropyl, new butyl, cyclopropyl, cyclohexyl, halogenated cyclopropyl, halogenated cyclohexyl, halogenated C_{1-6} alkyl, C_{2-4} alkenyl, hydroxyl-substituted C_{1-6} alkyl, C_{1-6} alkoxy, C_{1-6} alkoxycarbonyl, aminocarbonyl, C_{1-4} alkylaminocarbonyl, Di(C_{1-4} alkyl)aminocarbonyl, C_{3-6} cycloalkylaminocarbonyl, C_{3-6} cycloalkoxy, hydroxy-C_{1-4} alkoxy, halogenated C_{1-4} alkoxy, amino C_{1-4} alkyl, amino C_{1-4} alkoxy, C_{1-4} alkyl sulfone, C_{2-4} alkenyl sulfone, C_{3-6} cycloalkyl sulfone, heterocyclic oxy, amino-substituted piperidinyl, N-methylpiperidin-4-carbonyl, piperazine-C_{1-12} alkyl, formamide, and N-methyl piperidine carboxamide.

[0025] Further, R_4 can be selected from hydrogen, C_{1-6} alkyl, halogenated C_{1-6} alkyl, C_{1-6} alkoxy, halogenated C_{1-6} alkoxy, cyclopropyl, cyclopentyl, cyclohexyl, halogen substituted C_{3-6} cycloalkyl, C_{1-4} alkoxycarbonyl, C_{1-6} alkylcarbonyl, aminocarbonyl, C_{1-6} alkylcarbonyl, nitro, amino, C_{1-3} alkyl substituted amino, Di(C_{1-3} alkyl) substituted amino, oxazolyl, thiazinyl, pyridyl, dihydropyridyl, tetrahydropyridyl, piperidinyl, thiazinyl, pyrrolyl, imidazolyl, pyrazolyl, pyrazolyl, piperazinyl, morpholinyl, furanyl, pyranyl, phenyl, halogenated phenyl, benzyl, ethyl phenyl, dimethylphenyl, diethylphenyl, methyl (ethyl) phenyl, halogenated phenyl, and halomethylphenyl.

[0026] Further, R_5 and R_6 are hydrogen, halogen atoms, methyl, ethyl, and/or propyl. Preferably, R_5 and R_6 are hydrogen. When R_5 and R_6 are both hydrogen, there are no other substituents on naphthalene rings except diamides.

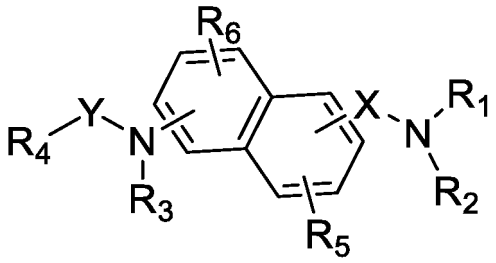
[0027] Further, R_1 and R_2 together with adjacent ring atoms can form a ring with 3-8 ring atoms and a substituted ring structure. A preferred structure is a 4-methyl-piperazinyl group or N-morpholinyl group.

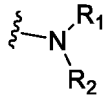
[0028] Further, when neither R_1 or R_2 is hydrogen, R_1 and R_2 are both methyl groups.

[0029] Further, when one of R_1 and R_2 is hydrogen, the other one can be selected from one of the following groups: methyl, ethyl, propyl, butyl, C_{1-4} alkyl substituted thiazolyl, thiazinyl, 2-thiazolyl or thiazol-2-yl, C_{1-4} alkyl substituted phenyl, trifluoromethylphenyl, meta-trifluoromethylphenyl, C_{1-4} alkyl substituted pyridyl, 6-chloro-piperidin-3-yl, 2-chloropyridin-5-yl, isopropyl, cyclopropyl, cyclohexyl, cyclohexane, and C_{1-4} alkyl substituted cyclohexyl.

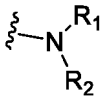
[0030] Further, R_4 can be selected from the following groups: 4-fluorophenyl, P-fluorophenyl, difluoro substituted phenyl, 3-methylphenyl, M-methylphenyl, P-methylphenyl, O-methylphenyl, ethyl phenyl, propyl phenyl, tert-butylphenyl, 2-methoxyphenyl, o-methoxyphenyl, ethoxyphenyl, di(ethoxy)phenyl, butyloxyphenyl, p-methoxyphenyl, methoxy phenyl, meta-trifluoromethylphenyl, P-trifluoromethylphenyl, 2,5-dimethoxyphenyl, M-chlorophenyl, P-chlorophenyl, 3,4-dichlorophenyl, trichloro-substituted phenyl, other halogen-substituted phenyl, C_{1-4} alkyl substituted phenyl, C_{1-4} alkoxy substituted phenyl, and C_{2-6} alkenyl substituted phenyl.

[0031] Specifically, the naphthalene diamide compound of the present disclosure can be one of the compounds in the following table, wherein X and Y are both carbonyl groups, R_5 and R_6 are hydrogen, and R_3 is hydrogen.



Number	R_4	
ABC-01	p-fluorophenyl	N-methyl-1-piperazinyl
ABC-02	p-fluorophenyl	2-thiazolimine
ABC-03	p-fluorophenyl	meta-trifluoromethyl phenylenimine
ABC-04	p-methoxyphenyl	N-methyl-1-piperazinyl
ABC-05	m-methylphenyl	N-methyl-1-piperazinyl
ABC-06	o-methoxyphenyl	N-methyl-1-piperazinyl
ABC-07	p-fluorophenyl	6-chloro-pyridine-3-methyleneamino
ABC-08	methoxy phenyl	6-chloro-pyridine-3-methyleneamino
ABC-09	m-methylphenyl	6-chloro-pyridine-3-methyleneamino
ABC-10	o-methoxyphenyl	6-chloro-pyridine-3-methyleneamino
ABC-11	p-fluorophenyl	N-morpholinyl
ABC-12	p-methoxyphenyl	N-morpholinyl
ABC-13	m-methylphenyl	N-morpholinyl
ABC-14	o-methoxyphenyl	N-morpholinyl
ABC-15	2,5-dimethoxyphenyl	6-chloro-pyridine-3-methyleneamino
ABC-16	2,5-dimethoxyphenyl	N-morpholinyl
ABC-17	meta-trifluoromethylphenyl	6-chloro-pyridine-3-methyleneamino
ABC-18	meta-trifluoromethylphenyl	N-morpholinyl
ABC-19	2,5-dimethoxyphenyl	N-methyl-1-piperazinyl
ABC-20	meta-trifluoromethylphenyl	N-methyl-1-piperazinyl
ABC-21	p-fluorophenyl	cyclopropylimine
ABC-22	p-fluorophenyl	cyclohexylimine
ABC-23	p-methoxyphenyl	cyclohexylimine
ABC-24	meta-trifluoromethylphenyl	cyclohexylimine
ABC-26	meta-trifluoromethylphenyl	meta-trifluoromethyl phenylenimine
ABC-27	p-methoxyphenyl	cyclopropylimine
ABC-28	meta-trifluoromethylphenyl	cyclopropylimine
ABC-29	p-methoxyphenyl	isopropylimine
ABC-30	meta-trifluoromethylphenyl	isopropylimine
ABC-31	p-methoxyphenyl	2-thiazolimine

(continued)

Number	R_4	
ABC-32	m-methylphenyl	2-thiazolimine
ABC-33	p-methoxyphenyl	meta-trifluoromethyl phenylenimine
ABC-34	meta-trifluoromethylphenyl	2-thiazolimine
ABC-36	p-fluorophenyl	isopropylimine
ABC-37	m-methylphenyl	isopropylimine
ABC-38	o-methoxyphenyl	isopropylimine
ABC-39	m-chlorophenyl	N-morpholinyl
ABC-40	3,4-dichlorophenyl	N-morpholinyl
ABC-41	m-chlorophenyl	N-methyl-1-piperazinyl
ABC-42	3,4-dichlorophenyl	N-methyl-1-piperazinyl
ABC-43	m-chlorophenyl	cyclopropylimine
ABC-44	3,4-dichlorophenyl	cyclopropylimine
ABC-45	m-chlorophenyl	2-thiazolimine
ABC-46	3,4-dichlorophenyl	2-thiazolimine
ABC-47	m-chlorophenyl	isopropylimine
ABC-48	3,4-dichlorophenyl	isopropylimine
ABC-50	o-methoxyphenyl	2-thiazolimine

[0032] Further, the naphthalene diamide compound of the present disclosure may also be one of the compounds in the following table, wherein X and Y are both sulfonyl groups or one of them is a sulfonyl group and the other is a carbonyl group, while R_5 and R_6 are hydrogen or a simple alkyl group, and R_3 is hydrogen.

ID	X	Y	R_4	R_1 R_2	R_5	R_6
ABC-51	sulfonyl	carbonyl	p-fluorophenyl	N-methyl-1-piperazinyl	methyl	ethyl
ABC-52	carbonyl	sulfonyl			isopropyl	methyl
ABC-53	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-54	sulfonyl	carbonyl	P-fluorophenyl	2-thiazolimine	methyl	ethyl
ABC-55	carbonyl	sulfonyl	P-fluorophenyl		isopropyl	methyl
ABC-56	sulfonyl	sulfonyl	P-fluorophenyl		ethyl	isopropyl
ABC-57	sulfonyl	carbonyl	p-fluorophenyl	meta-trifluoromethyl phenylenimine	methyl	ethyl
ABC-58	carbonyl	sulfonyl			isopropyl	methyl
ABC-59	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-60	sulfonyl	carbonyl	p-methoxyphenyl	N-methyl-1-piperazinyl	methyl	ethyl
ABC-61	carbonyl	sulfonyl		N-methyl-1-piperazinyl	isopropyl	methyl
ABC-62	sulfonyl	sulfonyl		N-methyl-1-piperazinyl	ethyl	isopropyl
ABC-63	sulfonyl	carbonyl	m-methylphenyl	N-methyl-1-piperazinyl	methyl	ethyl
ABC-64	carbonyl	sulfonyl			isopropyl	methyl
ABC-65	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-66	sulfonyl	carbonyl	o-methoxyphenyl	N-methyl-1-piperazinyl	methyl	Ethyl
ABC-67	carbonyl	sulfonyl			isopropyl	methyl
ABC-68	sulfonyl	sulfonyl			ethyl	isopropyl

(continued)

ID	X	Y	R_4		R_5	R_6
ABC-69	sulfonyl	carbonyl	p-fluorophenyl	6-chloro-pyridine-3-methyleneamino	methyl	Ethyl
ABC-70	carbonyl	sulfonyl			isopropyl	methyl
ABC-71	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-72	sulfonyl	carbonyl	methoxy phenyl	6-chloro-pyridine-3-methyleneamino	methyl	ethyl
ABC-73	carbonyl	sulfonyl			isopropyl	methyl
ABC-74	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-76	sulfonyl	carbonyl	m-methylphenyl	6-chloro-pyridine-3-methyleneamino	methyl	ethyl
ABC-77	carbonyl	sulfonyl			isopropyl	methyl
ABC-78	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-79	sulfonyl	carbonyl	o-methoxyphenyl	6-chloro-pyridine-3-methyleneamino	methyl	ethyl
ABC-80	carbonyl	sulfonyl			isopropyl	methyl
ABC-81	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-82	sulfonyl	carbonyl	p-fluorophenyl	N-morpholinyl	methyl	ethyl
ABC-83	carbonyl	sulfonyl		N-morpholinyl	isopropyl	methyl
ABC-84	sulfonyl	sulfonyl		N-morpholinyl	ethyl	isopropyl
ABC-85	sulfonyl	carbonyl	p-methoxyphenyl	N-morpholinyl	methyl	ethyl
ABC-86	carbonyl	sulfonyl		N-morpholinyl	isopropyl	methyl
ABC-87	sulfonyl	sulfonyl		N-morpholinyl	ethyl	isopropyl
ABC-88	sulfonyl	carbonyl	m-methylphenyl	N-morpholinyl	methyl	ethyl
ABC-89	carbonyl	sulfonyl		N-morpholinyl	isopropyl	methyl
ABC-90	sulfonyl	sulfonyl		N-morpholinyl	ethyl	isopropyl

(continued)

ID	X	Y	R_4		R_5	R_6
ABC-91	sulfonyl	carbonyl	o-methoxyphenyl	N-morpholinyl	methyl	ethyl
ABC-92	carbonyl	sulfonyl			isopropyl	methyl
ABC-93	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-94	sulfonyl	carbonyl	2,5-dimethoxyphenyl	6-chloro-pyridine-3-methyleneamino	methyl	ethyl
ABC-95	carbonyl	sulfonyl			isopropyl	methyl
ABC-96	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-97	sulfonyl	carbonyl	2,5-dimethoxyphenyl	N-morpholinyl	methyl	ethyl
ABC-98	carbonyl	sulfonyl			isopropyl	methyl
ABC-99	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-100	sulfonyl	carbonyl	meta-trifluoromethylphenyl	6-chloro-pyridine-3-methyleneamino	methyl	ethyl
ABC-101	carbonyl	sulfonyl			isopropyl	methyl
ABC-102	sulfonyl	sulfonyl			Ethyl	isopropyl
ABC-103	sulfonyl	carbonyl	meta-trifluoromethylphenyl	N-morpholinyl	methyl	ethyl
ABC-104	carbonyl	sulfonyl			isopropyl	methyl
ABC-105	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-106	sulfonyl	carbonyl	2,5-dimethoxyphenyl	N-methyl-1-piperazinyl	methyl	ethyl
ABC-107	carbonyl	sulfonyl		N-methyl-1-piperazinyl	isopropyl	methyl
ABC-108	sulfonyl	sulfonyl		N-methyl-1-piperazinyl	Ethyl	isopropyl
ABC-109	sulfonyl	carbonyl	meta-trifluoromethylphenyl	N-methyl-1-piperazinyl	methyl	ethyl
ABC-110	carbonyl	sulfonyl			isopropyl	methyl
ABC-111	sulfonyl	sulfonyl			ethyl	isopropyl

(continued)

ID	X	Y	R_4		R_5	R_6
ABC-112	sulfonyl	carbonyl	p-fluorophenyl	cyclopropylimine	methyl	ethyl
ABC-113	carbonyl	sulfonyl			isopropyl	methyl
ABC-114	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-115	sulfonyl	carbonyl	p-fluorophenyl	cyclohexylimine	methyl	ethyl
ABC-116	carbonyl	sulfonyl			isopropyl	methyl
ABC-117	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-118	sulfonyl	carbonyl	p-methoxyphenyl	cyclohexylimine	methyl	ethyl
ABC-119	carbonyl	sulfonyl			isopropyl	methyl
ABC-120	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-121	sulfonyl	carbonyl	meta-trifluoromethylphenyl	cyclohexylimine	methyl	ethyl
ABC-122	carbonyl	sulfonyl			isopropyl	methyl
ABC-123	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-124	sulfonyl	carbonyl	meta-trifluoromethylphenyl	m-trifluoromethylbenzylimino	methyl	ethyl
ABC-125	carbonyl	sulfonyl			isopropyl	methyl
ABC-126	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-127	sulfonyl	carbonyl	P-methoxyphenyl	cyclopropylimine	methyl	ethyl
ABC-128	carbonyl	sulfonyl		cyclopropylimine	isopropyl	methyl
ABC-129	sulfonyl	sulfonyl		cyclopropylimine	ethyl	isopropyl
ABC-130	sulfonyl	carbonyl	Meta-trifluoromethylphenyl	cyclopropylimine	methyl	ethyl
ABC-131	carbonyl	sulfonyl			isopropyl	methyl
ABC-132	sulfonyl	sulfonyl			ethyl	isopropyl

(continued)

ID	X	Y	R_4		R_5	R_6
ABC-133	sulfonyl	carbonyl	p-methoxyphenyl	isopropylimine	methyl	ethyl
ABC-134	carbonyl	sulfonyl		isopropylimine	isopropyl	methyl
ABC-135	sulfonyl	sulfonyl		isopropylimine	ethyl	isopropyl
ABC-136	sulfonyl	carbonyl	meta-trifluoromethylphenyl	isopropylimine	methyl	ethyl
ABC-137	carbonyl	sulfonyl			isopropyl	methyl
ABC-138	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-139	sulfonyl	carbonyl	p-methoxyphenyl	2-thiazolimine	methyl	ethyl
ABC-140	carbonyl	sulfonyl		2-thiazolimine	isopropyl	methyl
ABC-141	sulfonyl	sulfonyl		2-thiazolimine	ethyl	isopropyl
ABC-142	sulfonyl	carbonyl	m-methylphenyl	2-thiazolimine	methyl	ethyl
ABC-143	carbonyl	sulfonyl			isopropyl	methyl
ABC-144	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-145	sulfonyl	carbonyl	p-methoxyphenyl	meta-trifluoromethylphenylenimine	methyl	ethyl
ABC-146	carbonyl	sulfonyl			isopropyl	methyl
ABC-147	sulfonyl	sulfonyl			Ethyl	isopropyl
ABC-148	sulfonyl	carbonyl	meta-trifluoromethylphenyl	2-thiazolimine	methyl	Ethyl
ABC-149	carbonyl	sulfonyl			isopropyl	methyl
ABC-150	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-151	sulfonyl	carbonyl	p-fluorophenyl	isopropylimine	methyl	ethyl
ABC-152	carbonyl	sulfonyl			isopropyl	methyl
ABC-153	sulfonyl	sulfonyl			ethyl	isopropyl

(continued)

ID	X	Y	R_4		R_5	R_6
ABC-154	sulfonyl	carbonyl	m-methylphenyl	isopropylimine	methyl	ethyl
ABC-155	carbonyl	sulfonyl		isopropylimine	isopropyl	methyl
ABC-156	sulfonyl	sulfonyl		isopropylimine	ethyl	isopropyl
ABC-157	sulfonyl	carbonyl	o-methoxyphenyl	isopropylimine	methyl	ethyl
ABC-158	carbonyl	sulfonyl			isopropyl	methyl
ABC-159	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-160	sulfonyl	carbonyl	m-chlorophenyl	N-morpholinyl	methyl	ethyl
ABC-161	carbonyl	sulfonyl		N-morpholinyl	isopropyl	methyl
ABC-162	sulfonyl	sulfonyl		N-morpholinyl	ethyl	isopropyl
ABC-163	sulfonyl	carbonyl	3,4-dichlorophenyl	N-morpholinyl	methyl	ethyl
ABC-164	carbonyl	sulfonyl			isopropyl	methyl
ABC-165	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-166	sulfonyl	carbonyl	m-chlorophenyl	N-methyl-1-piperazinyl	methyl	ethyl
ABC-167	carbonyl	sulfonyl		N-methyl-1-piperazinyl	isopropyl	methyl
ABC-168	sulfonyl	sulfonyl		N-methyl-1-piperazinyl	ethyl	isopropyl
ABC-169	sulfonyl	carbonyl	3,4-dichlorophenyl	N-methyl-1-piperazinyl	methyl	ethyl
ABC-170	carbonyl	sulfonyl			isopropyl	methyl
ABC-171	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-172	sulfonyl	carbonyl	m-chlorophenyl	cyclopropylimine	methyl	ethyl
ABC-173	carbonyl	sulfonyl		cyclopropylimine	isopropyl	methyl
ABC-174	sulfonyl	sulfonyl		cyclopropylimine	ethyl	isopropyl

(continued)

ID	X	Y	R_4		R_5	R_6
ABC-175	sulfonyl	carbonyl	3,4-dichlorophenyl	cyclopropylimine	methyl	ethyl
ABC-176	carbonyl	sulfonyl			isopropyl	methyl
ABC-177	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-178	sulfonyl	carbonyl	m-chlorophenyl	2-thiazolimine	methyl	ethyl
ABC-179	carbonyl	sulfonyl			isopropyl	methyl
ABC-180	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-181	sulfonyl	carbonyl	3,4-dichlorophenyl	2-thiazolimine	methyl	ethyl
ABC-182	carbonyl	sulfonyl			isopropyl	methyl
ABC-183	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-184	sulfonyl	Carbonyl	m-chlorophenyl	isopropylimine	methyl	ethyl
ABC-185	carbonyl	sulfonyl			isopropyl	methyl
ABC-186	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-187	sulfonyl	carbonyl	3,4-dichlorophenyl	isopropylimine	methyl	ethyl
ABC-188	carbonyl	sulfonyl			isopropyl	methyl
ABC-189	sulfonyl	Sulfonyl			ethyl	isopropyl
ABC-190	sulfonyl	carbonyl	o-methoxyphenyl	2-thiazolimine	methyl	ethyl
ABC-191	carbonyl	sulfonyl			isopropyl	methyl
ABC-192	sulfonyl	sulfonyl			ethyl	isopropyl

[0033] The present disclosure also provides a process for preparation of the compounds of Formula I mentioned above.

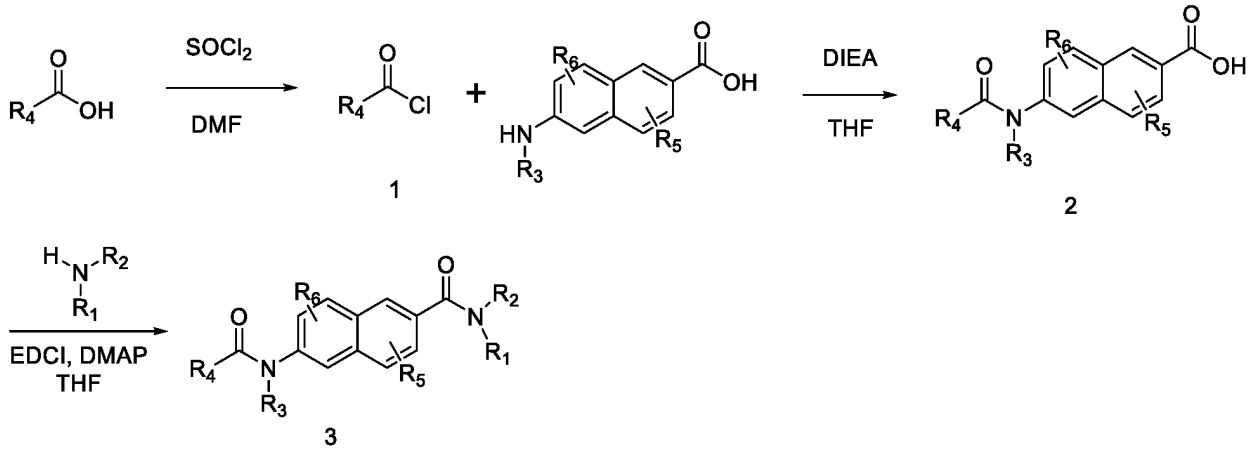
[0034] A method for synthesizing the above naphthalene diamide compound, comprising:

Substituting aromatic acid or other organic carboxylic acid in a solvent of dichloromethane and participating in the reaction, catalyzing with a small amount of DMF, stirring the reaction for several hours to form a series of acid chloride (the first compound (1) in the following reaction scheme);

The acid chloride is then immediately introduced into the carboxy-substituted naphthylamine. The reaction is carried out under the catalysis of THF (tetrahydrofuran) and DIEA (N, N-DiIsopropylethylamine) to obtain a series of carboxy-substituted naphthlamide (the following reaction) as the second compound (2) in this process;

The second compound and substituted amine was under stirring reaction catalyzed by EDCI (1-Ethyl-(3-dimethyl-aminopropyl) carbodiimide) and DMAP (4-dimethylaminopyridine) using THF as the solvent. A series of naphthalene diamide (the third product (3) shown in the following reaction scheme) was obtained.

[0035] The reaction process is shown as follows:



[0036] A drug comprises the above compound of Formula I or a pharmaceutically acceptable salt or ester with the compound as active ingredients. Any number and combination of the above compounds, salt, or ester form can be selected as active ingredients to produce the drug for treating tumor diseases with antibacterial, antiviral, and anti-inflammatory properties.

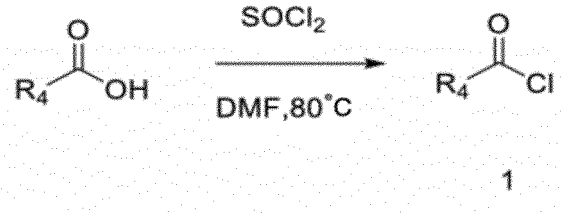
[0037] Compared with the prior scheme, the beneficial effects of the present disclosure are shown as follows: the present disclosure provides a novel compound based on the structure of Formula I, which can be effectively applied to treat and prevent tumor diseases caused by abnormal growth of various human cells.

[0038] Some of the technical terms in the present disclosure are explained as follows: Lower alkyl groups include, but are not limited to, methyl, ethyl, propyl, isopropyl, cyclopropyl, butyl, isobutyl, tert-butyl, N-pentyl, isoamyl, neopentyl, heji, heptyl. Halogens include fluorine, chlorinated, brominated, and iodine. C_{1-12} alkyl includes, but is not limited to, methyl, ethyl, propyl, isopropyl, butyl, isobutyl, tert-butyl, n-pentyl, isopentyl, neopentyl, sec-pentyl, tert-amyl, hexyl, heptyl, octyl, nonyl, decyl. C_{1-7} alkyl includes, but is not limited to, methyl, ethyl, propyl, Isopropyl, butyl, isobutyl, tert-butyl, n-pentyl, isopentyl, neopentyl, sec-pentyl, tert-amyl base, hexyl, heptyl, etc. Lower alkenyl groups include, but are not limited to, vinyl, propylene, butenyl, pentenyl, hexenyl, heptenyl, hepene, octenyl. C_{3-7} cycloalkyl groups include, but are not limited to, cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cycloheptyl.

[0039] The present disclosure will be further described in detail by the following case as proof-of-concept examples. However, the scope of the present disclosure is not to be limited to the following embodiments.

Example 1, preparation of compound as Formula 1

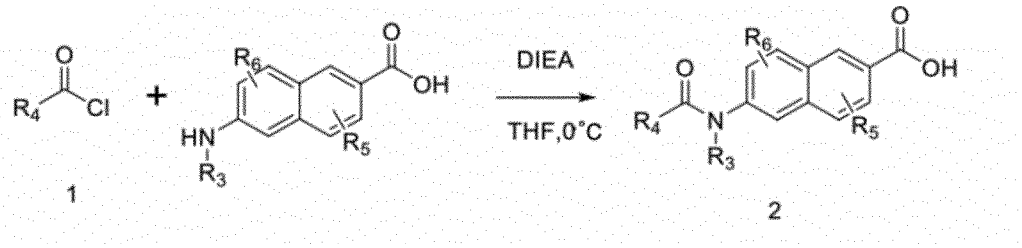
[0040]



[0041] 1.496 g (11 mmol) of m-methylbenzoic acid was placed in a 50mL round bottom flask, about 11mL of dichlorosulfoxide was added, and 3-4 drops of DMF were added to catalyze the reaction. The mixture was refluxed at 80°C for 3h. Thin layer chromatography (TLC) was used to follow the progress of the reaction. After the reaction was completed, the mixture was cooled to room temperature, and the excess $SOCl_2$ solvent was removed by rotary evaporation to obtain m-methylbenzoyl chloride.

Example 2, preparation of compound as formula 2

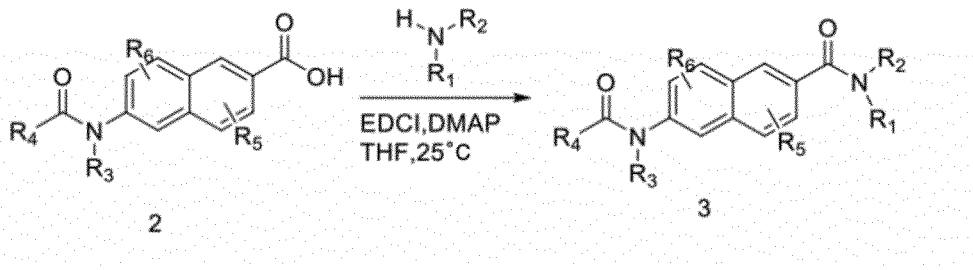
[0042]



[0043] 1.496g (8 mmol) of 6-aminonaphthoic acid was added to the flask, dissolved in THF. 16 mmol of DIEA was added, and the solution was stirred and kept at 0°C to obtain the m-methylbenzoyl chloride, which was subsequently dissolved in DCM and slowly added dropwise to the above mixed solution. Thin layer chromatography (TLC) was used to monitor the whole progress of the reaction. After the reaction was completed, the organic phase was concentrated by spin-drying to obtain a solid powder, and a small amount of diluted hydrochloric acid acidified solution was added, maintaining the pH of solution as weak acidic. The solid was filtered and washed 2-3 times with water. The crude compound 2a was obtained.

Example 3, preparation of compound as formula 3

[0044]



[0045] 76.5mg (0.25 mmol) of Compound 2a, 95mg (0.5 mmol) of EDCI, and 30mg (0.25 mmol) of DMAP were dissolved in tetrahydrofuran and stirred at room temperature for 15 min. Then 35.5mg (0.25 mmol) of 5-aminomethyl-2-chloropyridine was added. The reaction was stirred at room temperature for about 6h with the column separation for obtaining the final product ABC-09.

[0046] Example 4, using the synthesis method above by the schemes in examples 1-3, the compounds labelled ABC-1 to ABC-192 were separately synthesized and characterized. The NMR (nuclear magnetic resonance) and MS (mass spectrometry) data of the compounds were shown as follows:

ABC-01 : ^{1}H-NMR (DMSO-d_6, 400 MHz): δ 11.05 - 10.18 (m, 1H), 8.82 - 7.13 (m, 10H), 2.50 (p, J = 1.8 Hz, 6H),

2.38 (s, 4H), 2.23 (s, 2H) ppm. HRMS (ESI) m/z: $(M+H)^+$ calcd for $C_{23}H_{22}FN_3O_2$: 390.5; found:390.2.

ABC-02 : ^{1}H-NMR (DMSO-d_6, 400 MHz): δ 12.73 (s, 1H), 10.62 (s, 1H), 8.74 (d, *J* = 1.8 Hz, 1H), 8.56 (d, *J* = 2.0 Hz, 1H), 8.19 - 7.90 (m, 6H), 7.59 (d, *J* = 3.6 Hz, 1H), 7.46 - 7.25 (m, 3H) ppm. HRMS (ESI) m/z: $(M+H)^+$ calcd for $C_{21}H_{14}FN_3O_2S$: 390.4; found:390.3.

ABC-03 : ^{1}H-NMR (DMSO-d_6, 400 MHz): δ 10.70 (s, 1H), 10.60 (s, 1H), 8.57 (s, 2H), 8.30 (s, 1H), 8.21 - 7.84 (m, 7H), 7.63 (t, *J* = 8.0 Hz, 1H), 7.54 - 7.33 (m, 3H) ppm. HRMS (ESI) m/z: $(M+H)^+$ calcd for $C_{25}H_{16}F_4N_2O_2$: 451.4; found:451.2.

ABC-04 : ^{1}H-NMR (DMSO-d_6, 400 MHz): δ 8.30 (d, *J* = 2.1 Hz, 1H), 8.00 (s, 1H), 7.90 - 7.68 (m, 5H), 7.46 - 7.34 (m, 1H), 7.19 (s, 1H), 6.93 (d, *J* = 8.5 Hz, 2H), 3.82 (s, 3H), 3.81 - 2.99 (m, 4H), 2.66 - 2.12 (m, 4H), 1.19 (s, 3H) ppm. HRMS (ESI) m/z: $(M+H)^+$ calcd for $C_{24}H_{25}N_3O_3$: 402.5; found:402.3.

ABC-05 : ^{1}H-NMR (DMSO-d_6, 400 MHz): δ 10.48 (s, 1H), 8.52 (d, *J* = 2.0 Hz, 1H), 8.12 - 7.83 (m, 6H), 7.56 - 7.39 (m, 3H), 3.33 (s, 3H), 2.50 (p, *J* = 1.8 Hz, 2H), 2.39 (s, 5H), 2.11 (d, *J* = 99.2 Hz, 4H) ppm . HRMS (ESI) m/z: $(M+H)^+$ calcd for $C_{24}H_{25}N_3O_2$ 386.5; found:386.3.

ABC-06 : ^{1}H-NMR (DMSO-d_6, 400 MHz): δ 10.39 (s, 1H), 8.53 (d, *J* = 2.0 Hz, 1H), 3.93 (s, 3H), 3.78 (s, 4H), 2.55 - 2.49 (m, 5H), 2.19 (d, *J* = 12.8 Hz, 5H) ppm. HRMS (ESI) m/z: $(M+H)^+$ calcd for $C_{24}H_{25}N_3O_3$:402.5; found:402.2.

ABC-07 : ^{1}H-NMR (DMSO-d_6, 400 MHz): δ 10.56 (s, 1H), 9.23 (t, *J* = 5.9 Hz, 1H), 8.58 - 8.50 (m, 1H), 8.43 (d, *J* = 3.4 Hz, 2H), 8.15 - 7.84 (m, 7H), 7.58 - 7.31 (m, 3H), 4.54 (d, *J* = 5.8 Hz, 2H) ppm. HRMS (ESI) m/z: $(M+H)^+$ calcd for $C_{24}H_{17}ClFN_3O_2$: 432.9; found:432.2.

ABC-08 : ^{1}H-NMR (DMSO-d_6, 400 MHz): δ 10.39 (s, 1H), 9.23 (t, *J* = 6.0 Hz, 1H), 8.47 (d, *J* = 34.1 Hz, 3H), 8.12 - 7.75 (m, 7H), 7.50 (d, *J* = 8.2 Hz, 1H), 7.10 (d, *J* = 8.5 Hz, 2H), 4.54 (d, *J* = 5.8 Hz, 2H), 3.86 (s, 3H) ppm. HRMS (ESI) m/z: $(M+H)^+$ calcd for $C_{25}H_{20}ClN_3O_3$: 444.9; found:444.3.

ABC-09 : ^{1}H-NMR (DMSO-d_6, 400 MHz): δ 10.51 (s, 1H), 9.23 (t, *J* = 5.9 Hz, 1H), 8.53 (d, *J* = 1.9 Hz, 1H), 8.43 (d, *J* = 2.8 Hz, 2H), 8.08 - 7.75 (m, 8H), 7.60 - 7.42 (m, 2H), 4.55 (d, *J* = 5.8 Hz, 2H), 2.43 (s, 3H) ppm. HRMS (ESI) m/z: calcd for $C_{25}H_{20}ClN_3O_2$:428.9; found:428.3.

ABC-10 : ^{1}H-NMR (DMSO-d_6, 400 MHz): δ 10.43 (s, 1H), 8.54 (d, *J* = 2.0 Hz, 1H), 8.43 (d, *J* = 2.0 Hz, 2H), 7.93 (d, *J* = 1.2 Hz, 2H), 7.88 - 7.77 (m, 2H), 7.68 (dd, *J* = 7.6, 1.8 Hz, 1H), 7.56 - 7.42 (m, 3H), 7.31 - 6.95 (m, 3H), 4.55 (d, *J* = 5.8 Hz, 2H), 3.93 (s, 3H) ppm. HRMS (ESI) m/z: $(M+H)^+$ calcd for $C_{25}H_{20}ClN_3O_3$:444.9; found:444.2.

ABC-11 : ^{1}H-NMR (DMSO-d_6, 400 MHz):δ 10.37 (s, 1H), 8.51 (d, *J* = 2.0 Hz, 1H), 8.17 - 7.70 (m, 6H), 7.49 (dd, *J* = 8.4, 1.7 Hz, 1H), 7.39 - 6.89 (m, 2H), 3.86 (s, 3H), 3.48 (d, *J* = 119.1 Hz, 8H) ppm. HRMS (ESI) m/z: $(M+H)^+$ calcd for $C_{23}H_{22}N_2O_4$: 389.4; found:389.2.

ABC-12 : ^{1}H-NMR (DMSO-d_6, 400 MHz):δ 10.37 (s, 1H), 8.51 (d, *J* = 2.0 Hz, 1H), 8.17 - 7.70 (m, 6H), 7.49 (dd, *J* = 8.4, 1.7 Hz, 1H), 7.39 - 6.89 (m, 2H), 3.86 (s, 3H), 3.48 (d, *J* = 119.1 Hz, 8H) ppm. HRMS (ESI) m/z: $(M+H)^+$ calcd for $C_{23}H_{22}N_2O_4$: 389.4; found:389.2.

ABC-13 : ^{1}H-NMR (DMSO-d_6, 400 MHz): δ 8.32 (d, *J* = 2.1 Hz, 1H), 8.07 (s, 1H), 7.84 - 7.56 (m, 5H), 7.43 - 7.28 (m, 3H), 7.19 (s, 1H), 3.66 (s, 8H), 2.39 (s, 3H) ppm. HRMS (ESI) m/z: calcd for $C_{23}H_{22}N_2O_3$:373.4; found:373.3.

ABC-14 : ^{1}H-NMR (DMSO-d_6, 400 MHz): δ 10.09 (s, 1H), 8.36 (dd, *J* = 7.8, 1.8 Hz, 1H), 7.97 - 7.83 (m, 3H), 7.66 - 7.45 (m, 3H), 7.31 - 7.03 (m, 3H), 4.14 (s, 3H), 3.76 (s, 8H) ppm.HRMS (ESI) m/z: $(M+H)^+$ calcd for $C_{23}H_{22}N_2O_4$:389.4; found:389.3.

ABC-15 : ^{1}H-NMR (DMSO-d_6, 400 MHz): δ 10.24 (s, 1H), 8.47 (d, *J* = 40.5 Hz, 2H), 8.28 (s, 1H), 7.85 (dd, *J* = 20.3, 7.7 Hz, 4H), 7.59 (d, *J* = 8.9 Hz, 1H), 7.41 - 7.24 (m, 2H), 7.18 - 6.98 (m, 2H), 6.80 (s, 1H), 4.82 - 4.59 (m, 2H), 4.09 (d, *J* = 2.4 Hz, 3H), 3.88 (t, *J* = 1.8 Hz, 3H) ppm. HRMS (ESI) m/z: calcd for $C_{26}H_{22}ClN_3O_4$:474.9; found: 474.4.

[0047] A partial nuclear magnetic resonance spectrum is shown in Fig. 1 and Fig. 2, wherein Fig. 1 is the nuclear magnetic resonance spectrum of compound ABC-09 and Fig. 2 is the nuclear magnetic resonance spectrum of compound

ABC-46. The compounds numbered ABC-51 to ABC-192 were synthesized according to the procedures of Examples 1-3 with quantitative analysis.

Case study I: Antitumor cell activity of naphthalene diamides

[0048] Compounds of Tables 1 and 2 were synthesized in multiple steps according to the procedure of Examples 1-3 using relevant antitumor cell activity assays. The compound synthesized above was tested for IC_{50} concentration (MIC) against HCT-116, MCF-7, Calu-6 and A549 tumor cells by in vitro cellular activity. The results are shown as follows.

Case study II: Cell proliferation inhibition assay

[0049] Based on MTT method, briefly plating HCT-116, MCF-7 and A549 cells in a concentration of 2×10^4/ml with complete culture medium in 96-well plates overnight. The volume for each well was 100μL. Cells were treated with compounds in concentrations of 40, 20, 10, 5, 2.5, 1.25 μmol/L, and cultured at 37°C, 5% CO_2 for 48 hours, followed by adding 20μL of 5mg/ml MTT reagent per well and continuing to culture for 2~4h, respectively. As a control, DMSO solvent was added in an equal volume with concentration of 0.1%. Each sample was tested as 5 replicate wells. Then the supernatant was discarded, and DMSO was added in a volume of 150μL, followed by shaking and mixing for 15mins. The absorbance (A) value (A value is proportional to the number of living cells) is measured by a microplate reader at the wavelength of 570nm, and the average value is taken. The relative cell proliferation inhibition rate (%) = (control group A_{570} - experimental group A_{570}) / control group A_{570} x 100%. The concentration of 50% inhibition rate (IC_{50}) of the compound was calculated by the repetition of at least 3 times. The positive control was used as 5-flucrouracil.

[0050] The results (μmol/L) are shown as follows:

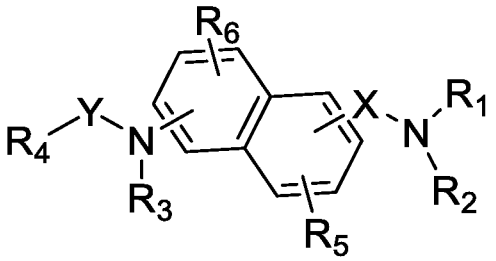
ID	HCT-116(IC50)	MCF-7(IC50)	Calu-6(IC50)	A549(IC50)
ABC-01				
ABC-02	10.0			
ABC-03				
ABC-04				
ABC-05	10.0			
ABC-06				
ABC-07	5.8	7.6		
ABC-08	10.0	10.9		
ABC-09	3.5	3.2		
ABC-10				
ABC-11	5.5	3.7		28.104
ABC-12				
ABC-13				
ABC-14				
ABC-15	6.6	3.5		
ABC-16				
ABC-17	3.6	3.2		
ABC-18				
ABC-19				
ABC-20	24.9	2.7		
ABC-21			48.5	48.502
ABC-22				
ABC-23				

(continued)

ID	HCT-116(IC50)	MCF-7(IC50)	Calu-6(IC50)	A549(IC50)
ABC-24	5			
ABC-26	3.5			
ABC-27	38.8	2.65		
ABC-28	5.0			
ABC-29	8.0			
ABC-30				
ABC-31		3.9		
ABC-32	5.5	2.9	28.1	14.2
ABC-33	3.0	6.6		
ABC-34	5.2	1.6		
ABC-36				
ABC-37				
ABC-38	5.0	9		
ABC-39				
ABC-40			12.4	
ABC-41				
ABC-42	20.0		7.1	3.7
ABC-43			25.3	25.25
ABC-44			5.5	
ABC-45	10.0	6.7	12.6	4.3
ABC-46	2.0	6.2		1.6
ABC-47	2.5			12.440
ABC-48	3.9			12.629
ABC-50				

Claims

1. **A naphthalene diamide compound comprising a structure expressed by the following structural formula (Formula I):**



Formula I

where X and Y can be selected from carbonyl group, thiocarbonyl group or sulfonyl group. R_1, R_2, and the

nitrogen atoms are conjugated to X or Y to form a ring with 3 to 12 ring atoms or a substituted ring structure substituted by a substituent M;

Or, R_1 and R_2 are independently selected from hydrogen, C_{1-12} alkyl, C_{1-12} alkoxy, C_{3-7} cycloalkyl, C_{1-12} alkoxycarbonyl, C_{1-12} alkylcarbonyl, aminocarbonyl, C_{1-12} alkylaminocarbonyl, nitro, oxazolyl, thiazolyl, pyridyl, dihydropyridyl, tetrahydropyridyl, piperidinyl, thiazinyl, pyrrolyl, imidazolyl, pyrazolyl, pyrimidinyl, piperazinyl, morpholinyl, furanyl, pyranyl, and other heterocyclic groups. The following group can be optionally substituted by a substituent M: an aryl group, a benzyl group, a heteroaryl group, an arylalkyl group, and a heteroaryl hydrocarbon group. The number of substituent M can be single or multiple. If substituents M are multiple, they are not relevant to each other, or they form a ring structure. If two substituents M form a ring structure and the linked group substituted by substituent M is also a ring structure, they may or may not form a condensed ring structure;

Substitute M can be hydrogen, fluorine, chlorine, bromine, iodine, cyano, nitro, hydroxyl, amino, C_{1-12} alkyl, halogenated C_{1-12} alkyl, perfluoro C_{1-12} alkyl, olyhalogenated C_{1-6} alkyl, aryl, substituted aryl, C_{1-12} alkylamino group, C_{3-12} cycloalkylamino group, di(C_{1-12} alkyl)amino group, C_{3-12} cycloalkyl group or substituted C_{3-12} cycloalkyl group;

The arylhydrocarbyl group substituted by the substituent M is a halogenated halophenyl hydrocarbon; alkoxyalkyl; perfluoroalkylphenyl hydrocarbon; hydrocarbyl-substituted phenyl hydrocarbon; nitro-substituted phenyl hydrocarbon; hydroxyl-substituted phenylhydrocarbyl;

The heteroaryl hydrocarbon group substituted by substituent M includes halogenated pyridine hydrocarbyl, halogenated furan hydrocarbyl, halogenated thiazole hydrocarbyl, halogenated pyrimidine hydrocarbyl, halogenated imidazole hydrocarbon group, nitro-substituted pyridine hydrocarbyl, nitro-substituted furan hydrocarbyl, nitro-substituted thiazole hydrocarbyl, nitro-substituted pyrimidine hydrocarbyl, nitro-substituted imidazole hydrocarbon group, amino-substituted pyridine hydrocarbyl, amino-substituted furan hydrocarbyl, amino-substituted thiazole hydrocarbyl, amino-substituted pyrimidine hydrocarbyl and amino-substituted imidazole hydrocarbon group;

R_3 can be selected from: hydrogen, fluorine, chlorine, bromine, iodine, nitro, amino, C_{1-3} alkyl, C_{1-3} alkoxy, C_{3-7} cycloalkyl, halogenated C_{3-7} cycloalkyl, halogenated C_{1-12} alkyl, C_{2-12} alkenyl, hydroxyl-substituted C_{1-12} alkyl, C_{1-12} alkoxy, C_{1-12} alkoxycarbonyl, aminocarbonyl, C_{1-6} alkylaminocarbonyl, Di(C_{1-12} alkyl)aminocarbonyl, C_{3-7} cycloalkyl aminocarbonyl, C_{3-7} cycloalkyloxy, hydroxy-C_{1-12} alkoxy, halogenated C_{1-12} alkoxy, amino C_{1-12} alkyl, amino C_{1-12} alkoxy, C_{1-12} alkyl sulfone, C_{2-12} alkenyl sulfone, C_{3-7} cycloalkyl sulfone, heterocyclic oxy, amino substituted piperidinyl, N-methylpiperidin-4-carbonyl, piperazine- C_{1-12} alkyl, formamide, N-methyl piperidine formamide;

R_4 can be selected from: hydrogen, C_{1-12} alkyl, C_{1-12} alkoxy, C_{3-7} cycloalkyl, halogen-substituted C_{3-7} cycloalkyl, C_{1-6} alkoxycarbonyl, C_{1-12} alkylcarbonyl, aminocarbonyl, C_{1-12} alkylaminocarbonyl, nitro, amino, C_{1-3} alkyl substituted amino, di (C_{1-3} alkyl) substituted amino, oxazolyl, thiazolyl, pyridyl, dihydropyridyl, tetrahydropyridyl, piperidinyl, thiazinyl, pyrrolyl, imidazolyl, pyrazolyl, pyrimidinyl, piperazinyl, morpholinyl, furanyl, pyranyl and other heterocyclic groups. The following group can be optionally substituted by a substituent Q: an aryl group, a benzyl group, a heteroaryl group, an arylalkyl group, and a heteroaryl hydrocarbon group. The substituent Q can be double and multiple groups independently, which form ring structures via molecular interconnections;

When each substituent Q is an independent substituent, each substituent Q can be separately selected from hydrogen, fluorine, chlorine, bromine, iodine, cyano, nitro, hydroxyl, amino, C_{1-12} alkyl, halogenated C_{1-12} alkyl, perfluoro-C_{1-12} alkyl, polyhalogenated C_{1-12} alkyl, C_{1-12} alkoxy, halogenated C_{1-12} alkoxy, aryl, substituted aryl, C_{1-12} alkyl amino, C_{3-7} cycloalkylamino, Di(C_{1-12} alkyl)amino, or C_{3-7} cycloalkyl and substituted C_{3-7} cycloalkyl;

The sum of R_5 and R_6 is 0-6; when there are more than two R_5 and R_6, they are independent of each other;

R_5 and R_6 are separately selected from hydrogen, fluorine, chlorine, bromine, iodine, nitro, hydroxyl, amino, C_{1-12} alkyl, C_{1-12} alkoxy, C_{3-7} cycloalkyl, halogenated C_{1-12} alkyl, C_{2-12} alkenyl, hydroxyl-substituted C_{1-12} alkyl, C_{1-12} alkylamino, C_{3-7} cycloalkylamino, di(C_{1-12} alkyl)amino, amino-C_{1-12} alkylamino, C_{1-12} alkoxy, C_{1-12} alkylamino, C_{1-12} alkoxycarbonyl, di(C_{1-12} alkoxy-C_{1-12} alkyl) amino, aminocarbonyl, C_{1-12} alkylaminocarbonyl, di(C_{1-12} alkyl)aminocarbonyl, C_{3-7} cycloalkylaminocarbonyl, C_{3-7} cycloalkoxy, hydroxy-C_{1-12} alkoxy, halogenated C_{1-12} alkoxy, amino C_{1-12} alkyl, amino C_{1-12} alkoxy, C_{1-12} alkyl sulfone, C_{2-12} alkenyl sulfone, C_{3-7} cycloalkyl sulfone, halogenated C_{3-7} cycloalkyl, heterocyclic oxy, N-methylpiperidin-4-carbonyl, piperazine-C_{1-6} alkyl, formamide, and N-methyl piperidine carboxamide.

2. The compound of Claim 1, wherein the X can be carbonyl, thiocarbonyl, or sulfonyl group; Y can be carbonyl, thiocarbonyl, or sulfonyl group.

3. The compound of Claim 1, wherein X substituents are in the β position of the naphthalene ring and N substituents (connected to Y, shown in the formula) are in the non-substituted para-position of the naphthalene ring.

4. The compound of Claim 1, wherein R_1, R_2, and nitrogen atoms connected to them can form a pyrrole ring, tetrahydropyrrole ring, pyridine ring, tetrahydropyridine ring, piperidine ring, piperazine ring, oxazine ring, tetrahydroxazine ring, and morpholine ring; and when R_1, R_2, and annular atoms connected to them form a substituted ring structure with 3-8 ring atoms, the formed ring structure should be 4-methyl-piperazinyl or N-morpholinyl; or R_1 and R_2 are selected independently from hydrogen, C_{1-6} alkyl, C_{1-6} alkoxy, cyclopropane, cyclohexane, C_{1-4} alkoxycarbonyl, C_{1-4} alkylcarbonyl, aminocarbonyl, C_{1-4} alkylaminocarbonyl, nitro, oxazolyl, thiazolyl, pyridyl, dihydropyridyl, tetrahydropyridyl, piperidinyl, thiazinyl, pyrrolyl, imidazolyl, pyrazolyl, pyrimidinyl, piperazinyl, morpholinyl, furanyl, pyranyl, phenyl, C_{1-4} alkyl substituted phenyl, di(C_{1-4} alkyl) substituted phenyl.

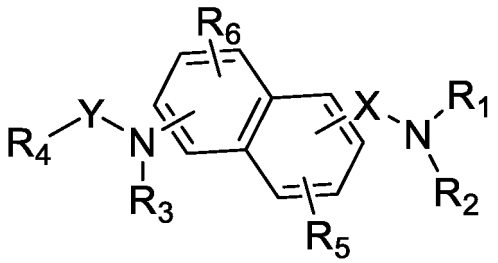
5. The compound of Claim 1, wherein R_3 can be selected from: hydrogen, fluorine, chlorine, bromine, iodine, nitro, amino, methyl, ethyl, propyl, isopropyl, neo-butyl, cyclopropyl, cyclohexyl, halogenated cyclopropyl, halogenated cyclohexyl, halogenated C_{1-6} alkyl, C_{2-4} alkenyl, hydroxyl-substituted C_{1-6} alkyl, C_{1-6} alkoxy, C_{1-6} alkoxycarbonyl, aminocarbonyl, C_{1-4} alkylaminocarbonyl, di(C_{1-4} alkyl) amino carbonyl, C_{3-6} cycloalkoxy, hydroxyl-C_{1-4} alkoxy, halogenated C_{1-4} alkoxy, amino C_{1-4} alkyl, amino C_{1-4} alkoxy, C_{1-4} alkyl sulfone, C_{2-4} alkenyl sulfone, C_{3-6} cycloalkyl sulfone, heterocyclic oxy, amino substituted piperidinyl, N-methyl piperidine-4-carbonyl, piperazine-C_{1-12} alkyl, formamide, and N-methyl piperidine formamide.

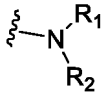
6. The compound of Claim 1, wherein R_4 can be selected from hydrogen, C_{1-6} alkyl, halogenated C_{1-6} alkyl, C_{1-6} alkoxy, halogenated C_{1-6} alkoxy, cyclopropyl, cyclopentanyl, cyclohexyl, halogenated C_{3-6} cycloalkyl, C_{1-4} alkoxycarbonyl, C_{1-6} alkyl carbonyl, aminocarbonyl, C_{1-6} alkylaminocarbonyl, nitro, amino, C_{1-3} alkyl substituted amino group, di(C_{1-3} alkyl) substituted amino, oxazolyl, thiazolyl, pyridyl, dihydropyridyl, tetrahydropyridyl, piperidinyl, thiazinyl, pyrrolyl, imidazolyl, pyrazoyl, pyrimidinyl, piperazinyl, morpholinyl, furanyl, pyranyl, phenyl, halogenated phenyl, benzyl, ethyl phenyl, dimethyl phenyl, diethylphenyl, methyl (ethyl) phenyl, halophenyl, and halomethylphenyl; and R_4 can be selected from the following groups: p-fluorophenyl, difluoro-substituted phenyl, m-methylphenyl, p-methylphenyl, o-methylphenyl, ethylphenyl, propylphenyl, tert-butyl phenyl, o-methoxyphenyl, ethoxyphenyl, di (ethoxy) phenyl, butyloxyphenyl, p-methoxyphenyl, m-trifluoromethyl-substituted phenyl, p-trifluoromethyl-substituted phenyl, 2,5-dimethoxyphenyl, m-chloro-substituted phenyl, 4-chloro-substituted phenyl, 3,4-dichloro-substituted phenyl, and trichloro-substituted phenyl.

7. The compound of Claim 1, wherein R_5 and R_6 can be selected from hydrogen, halogen atoms, methyl, ethyl, and propyl groups.

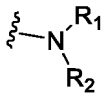
8. The compound of Claim 1, wherein either R_1 or R_2 group is hydrogen, and the other is selected from one of the following groups: methyl, ethyl, propyl, butyl, thiazolyl, C_{1-4} alkyl substituted thiazolyl, thiazol-2-yl, C_{1-4} alkyl substituted phenyl, C_{1-4} alkyl substituted pyridine, trifluoromethyl substituted phenyl, 2-chloropyridine-5-yl, isopropyl, cyclopropyl, cyclohexyl, and C_{1-4} alkyl substituted cyclohexyl. Or, if neither R_1 or R_2 is hydrogen, both R_1 and R_2 are methyl groups.

9. The compound of Claim 1, wherein if naphthalene diamide compound is any one of the compounds in the following table, in which X and Y are carbonyl, R_5 and R_6 are hydrogen, and R_3 is hydrogen;

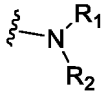


Number	R_4	
ABC-01	p-fluorophenyl	N-methyl-1-piperazine
ABC-02	p-fluorophenyl	2-thiazole imino group

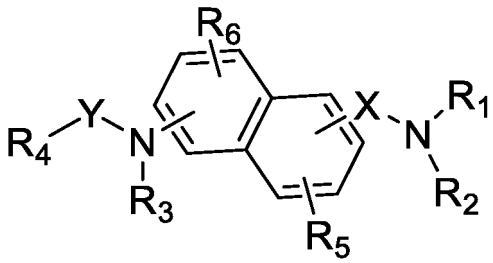
(continued)

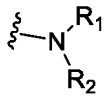
Number	R_4	
ABC-03	p-fluorophenyl	Meta-trifluoromethyl phenylenimine
ABC-04	P-methoxyphenyl	N-methyl-1-piperazinyl
ABC-05	m-methyl phenyl	N-methyl-1-piperazinyl
ABC-06	o-methoxyphenyl	N-methyl-1-piperazinyl
ABC-07	p-fluorophenyl	6-chloro-pyridine-3-methyleneamino
ABC-08	methoxy phenyl	6-chloro-pyridine-3-methyleneamino
ABC-09	m-methylphenyl	6-chloro-pyridine-3-methyleneamino
ABC-10	o-methoxyphenyl	6-chloro-pyridine-3-methyleneamino
ABC-11	p-fluorophenyl	N-morpholinyl
ABC-12	p-methoxyphenyl	N-morpholinyl
ABC-13	m-methylphenyl	N-morpholinyl
ABC-14	o-methoxyphenyl	N-morpholinyl
ABC-15	2,5-dimethoxyphenyl	6-chloro-pyridine-3-methyleneamino
ABC-16	2,5-dimethoxyphenyl	N-morpholinyl
ABC-17	meta-trifluoromethylphenyl	6-chloro-pyridine-3-methyleneamino
ABC-18	meta-trifluoromethylphenyl	N-morpholinyl
ABC-19	2,5-dimethoxyphenyl	N-methyl-1-piperazinyl
ABC-20	meta-trifluoromethylphenyl	N-methyl-1-piperazinyl
ABC-21	p-fluorophenyl	cyclopropylimine
ABC-22	p-fluorophenyl	cyclohexylimine
ABC-23	p-methoxyphenyl	cyclohexylimine
ABC-24	meta-trifluoromethylphenyl	cyclohexylimine
ABC-26	meta-trifluoromethylphenyl	meta-trifluoromethyl phenylenimine
ABC-27	p-methoxyphenyl	cyclopropylimine
ABC-28	meta-trifluoromethylphenyl	cyclopropylimine
ABC-29	p-methoxyphenyl	isopropylimine
ABC-30	meta-trifluoromethylphenyl	isopropylimine
ABC-31	p-methoxyphenyl	2-thiazolimine
ABC-32	m-methylphenyl	2-thiazolimine
ABC-33	p-methoxyphenyl	meta-trifluoromethyl phenylenimine
ABC-34	meta-trifluoromethylphenyl	2-thiazolimine
ABC-36	p-fluorophenyl	isopropylimine
ABC-37	m-methylphenyl	isopropylimine
ABC-38	o-methoxyphenyl	isopropylimine
ABC-39	m-chlorophenyl	N-morpholinyl
ABC-40	3,4-dichlorophenyl	N-morpholinyl

(continued)

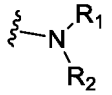
Number	R_4	
ABC-41	m-chlorophenyl	N-methyl-1-piperazinyl
ABC-42	3,4-dichlorophenyl	N-methyl-1-piperazinyl
ABC-43	m-chlorophenyl	cyclopropylimine
ABC-44	3,4-dichlorophenyl	cyclopropylimine
ABC-45	m-chlorophenyl	2-thiazolimine
ABC-46	3,4-dichlorophenyl	2-thiazolimine
ABC-47	m-chlorophenyl	isopropylimine
ABC-48	3,4-dichlorophenyl	isopropylimine
ABC-50	o-methoxyphenyl	2-thiazolimine

or, in the structural formula, where X and Y are both sulfonyl groups, or one of them is a sulfonyl group and the other is a carbonyl group, R_5 and R_6 are hydrogen or a simple alkyl group, and R_3 is hydrogen;

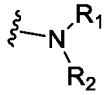


Number	X	Y	R_4		R_5	R_6
ABC-51	sulfonyl	carbonyl	p-fluorophenyl	N-methyl-1-piperazinyl	methyl	ethyl
ABC-52	carbonyl	sulfonyl			isopropyl	methyl
ABC-53	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-54	sulfonyl	carbonyl	p-fluorophenyl	2-thiazolimine	methyl	ethyl
ABC-55	carbonyl	sulfonyl	p-fluorophenyl		isopropyl	methyl
ABC-56	sulfonyl	sulfonyl	p-fluorophenyl		ethyl	isopropyl
ABC-57	sulfonyl	carbonyl	p-fluorophenyl	meta-trifluoroMethyl phenylenimine	methyl	ethyl
ABC-58	carbonyl	sulfonyl			isopropyl	methyl
ABC-59	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-60	sulfonyl	carbonyl	p-methoxyphenyl	N-Methyl-1-piperazinyl	methyl	ethyl
ABC-61	carbonyl	sulfonyl		N-Methyl-1-piperazinyl	isopropyl	methyl
ABC-62	sulfonyl	sulfonyl		N-Methyl-1-piperazinyl	ethyl	isopropyl

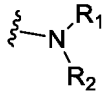
(continued)

Number	X	Y	R_4		R_5	R_6
ABC-63	sulfonyl	carbonyl	m-Methylphenyl	N-Methyl-1-piperazinyl	methyl	ethyl
ABC-64	carbonyl	sulfonyl			isopropyl	methyl
ABC-65	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-66	sulfonyl	carbonyl	o-methoxyphenyl	N-Methyl-1-piperazinyl	methyl	ethyl
ABC-67	carbonyl	sulfonyl			isopropyl	methyl
ABC-68	sulfonyl	sulfonyl			ethyl	Isopropyl
ABC-69	sulfonyl	carbonyl	p-fluorophenyl	6-chloro-pyridine-3-Methyleneamino	methyl	ethyl
ABC-70	carbonyl	sulfonyl			Isopropyl	Methyl
ABC-71	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-72	sulfonyl	carbonyl	methoxy phenyl	6-chloro-pyridine-3-Methyleneamino	methyl	ethyl
ABC-73	carbonyl	sulfonyl			isopropyl	methyl
ABC-74	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-76	sulfonyl	carbonyl	m-Methylphenyl	6-chloro-pyridine-3-Methyleneamino	methyl	ethyl
ABC-77	carbonyl	sulfonyl			isopropyl	methyl
ABC-78	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-79	sulfonyl	carbonyl	o-methoxyphenyl	6-chloro-pyridine-3-Methyleneamino	methyl	ethyl
ABC-80	carbonyl	sulfonyl			isopropyl	methyl
ABC-81	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-82	sulfonyl	carbonyl	p-fluorophenyl	N-morpholinyl	methyl	ethyl
ABC-83	carbonyl	sulfonyl		N-morpholinyl	isopropyl	methyl
ABC-84	sulfonyl	sulfonyl		N-morpholinyl	ethyl	isopropyl
ABC-85	sulfonyl	carbonyl	p-methoxyphenyl	N-morpholinyl	methyl	ethyl
ABC-86	carbonyl	sulfonyl		N-morpholinyl	isopropyl	methyl
ABC-87	sulfonyl	sulfonyl		N-morpholinyl	ethyl	isopropyl
ABC-88	sulfonyl	carbonyl	m-Methylphenyl	N-morpholinyl	methyl	ethyl
ABC-89	carbonyl	sulfonyl		N-morpholinyl	isopropyl	methyl
ABC-90	sulfonyl	sulfonyl		N-morpholinyl	ethyl	isopropyl
ABC-91	sulfonyl	carbonyl	o-methoxyphenyl	N-morpholinyl	methyl	ethyl
ABC-92	carbonyl	sulfonyl			isopropyl	methyl
ABC-93	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-94	sulfonyl	carbonyl	2,5-dimethoxyphenyl	6-chloro-pyridine-3-Methyleneamino	methyl	ethyl
ABC-95	carbonyl	sulfonyl			isopropyl	methyl
ABC-96	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-97	sulfonyl	carbonyl	2,5-dimethoxyphenyl	N-morpholinyl	methyl	ethyl
ABC-98	carbonyl	sulfonyl			isopropyl	methyl
ABC-99	sulfonyl	sulfonyl			ethyl	isopropyl

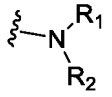
(continued)

Number	X	Y	R_4		R_5	R_6
ABC-100	sulfonyl	carbonyl	meta-trifluoroMethylphenyl	6-chloro-pyridine-3-Methyleneamino	methyl	ethyl
ABC-101	carbonyl	sulfonyl			isopropyl	methyl
ABC-102	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-103	sulfonyl	carbonyl	meta-trifluoromethylphenyl	N-morpholinyl	methyl	ethyl
ABC-104	carbonyl	sulfonyl			isopropyl	methyl
ABC-105	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-106	sulfonyl	carbonyl	2,5-dimethoxyphenyl	N-Methyl-1-piperazinyl	methyl	ethyl
ABC-107	carbonyl	sulfonyl		N-Methyl-1-piperazinyl	isopropyl	methyl
ABC-108	sulfonyl	sulfonyl		N-Methyl-1-piperazinyl	ethyl	isopropyl
ABC-109	sulfonyl	carbonyl	meta-trifluoroMethylphenyl	N-Methyl-1-piperazinyl	methyl	ethyl
ABC-110	carbonyl	sulfonyl			isopropyl	methyl
ABC-111	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-112	sulfonyl	carbonyl	p-fluorophenyl	cyclopropylimine	methyl	ethyl
ABC-113	carbonyl	sulfonyl			isopropyl	methyl
ABC-114	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-115	sulfonyl	carbonyl	p-fluorophenyl	cyclohexylimine	methyl	ethyl
ABC-116	carbonyl	sulfonyl		cyclohexylimine	isopropyl	methyl
ABC-117	sulfonyl	sulfonyl		cyclohexylimine	ethyl	isopropyl
ABC-118	sulfonyl	carbonyl	p-methoxyphenyl	cyclohexylimine	methyl	ethyl
ABC-119	carbonyl	sulfonyl		cyclohexylimine	isopropyl	methyl
ABC-120	sulfonyl	sulfonyl		cyclohexylimine	ethyl	isopropyl
ABC-121	sulfonyl	carbonyl	meta-trifluoroMethylphenyl	cyclohexylimine	methyl	ethyl
ABC-122	carbonyl	sulfonyl	meta-trifluoroMethylphenyl		isopropyl	methyl
ABC-123	sulfonyl	sulfonyl	meta-trifluoroMethylphenyl		ethyl	isopropyl
ABC-124	sulfonyl	carbonyl	meta-trifluoroMethylphenyl	m-trifluoromethylbenzylimino	methyl	ethyl
ABC-125	carbonyl	sulfonyl			isopropyl	methyl
ABC-126	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-127	sulfonyl	carbonyl	p-methoxyphenyl	cyclopropylimine	methyl	ethyl
ABC-128	carbonyl	sulfonyl		cyclopropylimine	isopropyl	methyl
ABC-129	sulfonyl	sulfonyl		cyclopropylimine	ethyl	isopropyl
ABC-130	sulfonyl	carbonyl	meta-trifluoroMethylphenyl	cyclopropylimine	methyl	ethyl
ABC-131	carbonyl	sulfonyl			isopropyl	methyl
ABC-132	sulfonyl	sulfonyl			ethyl	isopropyl

(continued)

Number	X	Y	R_4		R_5	R_6
ABC-133	sulfonyl	carbonyl	p-methoxyphenyl	isopropylimine	methyl	ethyl
ABC-134	carbonyl	sulfonyl		isopropylimine	isopropyl	methyl
ABC-135	sulfonyl	sulfonyl		isopropylimine	ethyl	isopropyl
ABC-136	sulfonyl	carbonyl	meta-trifluoroMethylphenyl	isopropylimine	methyl	ethyl
ABC-137	carbonyl	sulfonyl			isopropyl	methyl
ABC-138	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-139	sulfonyl	carbonyl	p-methoxyphenyl	2-thiazolimine	methyl	ethyl
ABC-140	carbonyl	sulfonyl		2-thiazolimine	isopropyl	methyl
ABC-141	sulfonyl	sulfonyl		2-thiazolimine	ethyl	isopropyl
ABC-142	sulfonyl	carbonyl	m-Methylphenyl	2-thiazolimine	methyl	ethyl
ABC-143	carbonyl	sulfonyl			isopropyl	methyl
ABC-144	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-145	sulfonyl	carbonyl	p-methoxyphenyl	meta-trifluoroMethyl phenylenimine	methyl	ethyl
ABC-146	carbonyl	sulfonyl			isopropyl	methyl
ABC-147	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-148	sulfonyl	carbonyl	meta-trifluoroMethylphenyl	2-thiazolimine	methyl	ethyl
ABC-149	carbonyl	sulfonyl			isopropyl	Methyl
ABC-150	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-151	sulfonyl	carbonyl	p-fluorophenyl	isopropylimine	methyl	ethyl
ABC-152	carbonyl	sulfonyl			isopropyl	methyl
ABC-153	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-154	sulfonyl	carbonyl	m-Methylphenyl	isopropylimine	methyl	ethyl
ABC-155	carbonyl	sulfonyl		isopropylimine	isopropyl	methyl
ABC-156	sulfonyl	sulfonyl		isopropylimine	ethyl	isopropyl
ABC-157	sulfonyl	carbonyl	o-methoxyphenyl	isopropylimine	methyl	ethyl
ABC-158	carbonyl	sulfonyl			isopropyl	methyl
ABC-159	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-160	sulfonyl	carbonyl	m-ch lorophenyl	N-morpholinyl	methyl	ethyl
ABC-161	carbonyl	sulfonyl		N-morpholinyl	isopropyl	methyl
ABC-162	sulfonyl	sulfonyl		N-morpholinyl	ethyl	isopropyl
ABC-163	sulfonyl	carbonyl	3,4-dichlorophenyl	N-morpholinyl	methyl	ethyl
ABC-164	carbonyl	sulfonyl			isopropyl	methyl
ABC-165	sulfonyl	sulfonyl			ethyl	isopropyl

(continued)

Number	X	Y	R_4		R_5	R_6
ABC-166	sulfonyl	carbonyl	m-ch lorophenyl	N-Methyl-1-piperazinyl	methyl	ethyl
ABC-167	carbonyl	sulfonyl		N-Methyl-1-piperazinyl	isopropyl	methyl
ABC-168	sulfonyl	sulfonyl		N-Methyl-1-piperazinyl	ethyl	isopropyl
ABC-169	sulfonyl	carbonyl	3,4-dichlorophenyl	N-methyl-1-piperazinyl	methyl	ethyl
ABC-170	carbonyl	sulfonyl			isopropyl	methyl
ABC-171	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-172	sulfonyl	carbonyl	m-chlorophenyl	cyclopropylimide	methyl	ethyl
ABC-173	carbonyl	sulfonyl		cyclopropylimide	isopropyl	methyl
ABC-174	sulfonyl	sulfonyl		cyclopropylimide	ethyl	isopropyl
ABC-175	sulfonyl	carbonyl	3,4-dichlorophenyl	cyclopropylimide	methyl	ethyl
ABC-176	carbonyl	sulfonyl			isopropyl	methyl
ABC-177	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-178	sulfonyl	carbonyl	m-chlorophenyl	2-thiazole imino group	methyl	ethyl
ABC-179	sulfonyl	sulfonyl		2-thiazole imino group	isopropyl	methyl
ABC-180	sulfonyl	sulfonyl		2-thiazole imino group	ethyl	isopropyl
ABC-181	sulfonyl	carbonyl	3,4-dichlorophenyl	2-thiazole imino group	methyl	ethyl
ABC-182	carbonyl	sulfonyl			isopropyl	methyl
ABC-183	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-184	sulfonyl	carbonyl	m-chlorophenyl	isopropyl imide	methyl	ethyl
ABC-185	carbonyl	sulfonyl			isopropyl	methyl
ABC-186	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-187	sulfonyl	carbonyl	3,4-dichlorophenyl	isopropylimide	methyl	ethyl
ABC-188	carbonyl	sulfonyl			isopropyl	methyl
ABC-189	sulfonyl	sulfonyl			ethyl	isopropyl
ABC-190	sulfonyl	carbonyl	o-methoxyphenyl	2-thiazole imino group	methyl	ethyl
ABC-191	carbonyl	sulfonyl			isopropyl	methyl
ABC-192	sulfonyl	sulfonyl			ethyl	isopropyl

10. A drug comprising a compound of a structure expressed by Formula I or biologically acceptable salt or ester forms of the compound as an active ingredient.

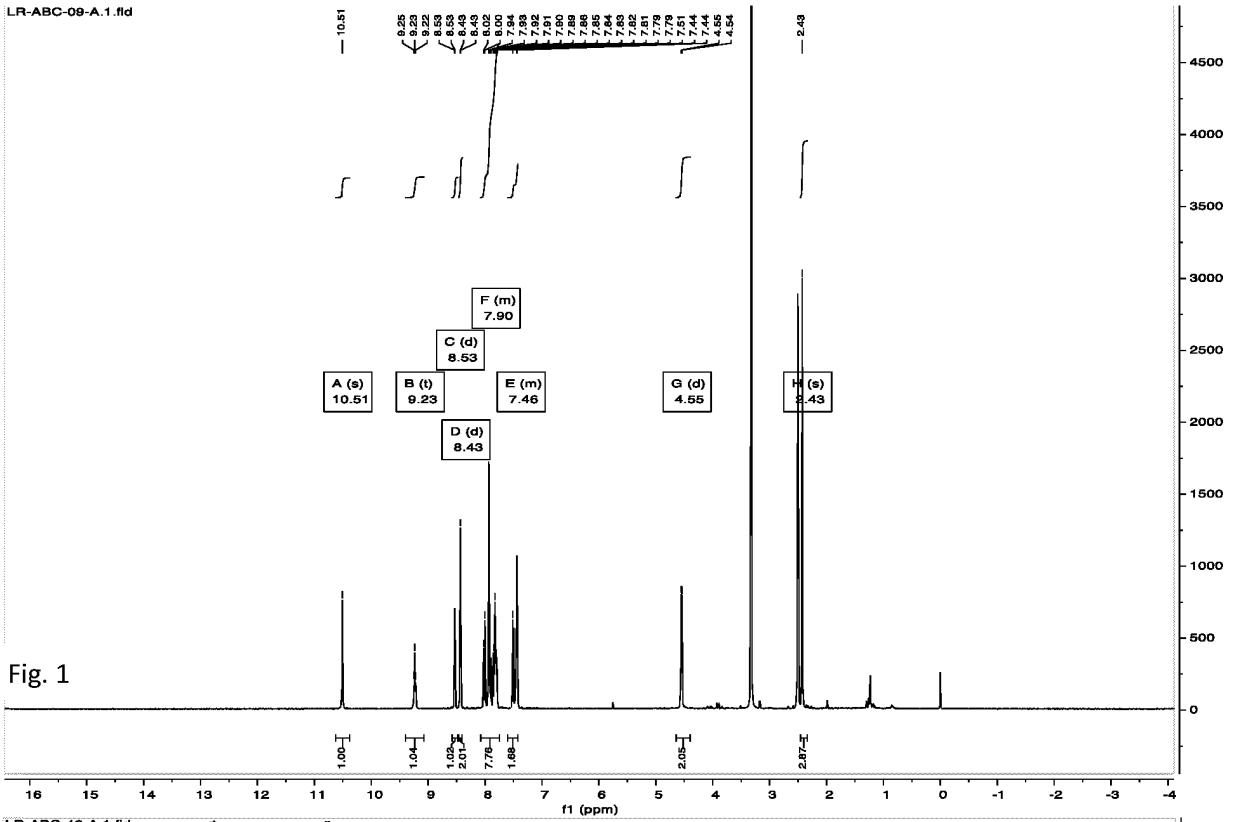

LR-ABC-09-A.1.fid
A (s) 10.51
B (t) 9.23
C (d) 8.53
D (d) 8.43
E (m) 7.46
F (m) 7.90
G (d) 4.55
H (s) 2.43
f1 (ppm)

Fig. 1

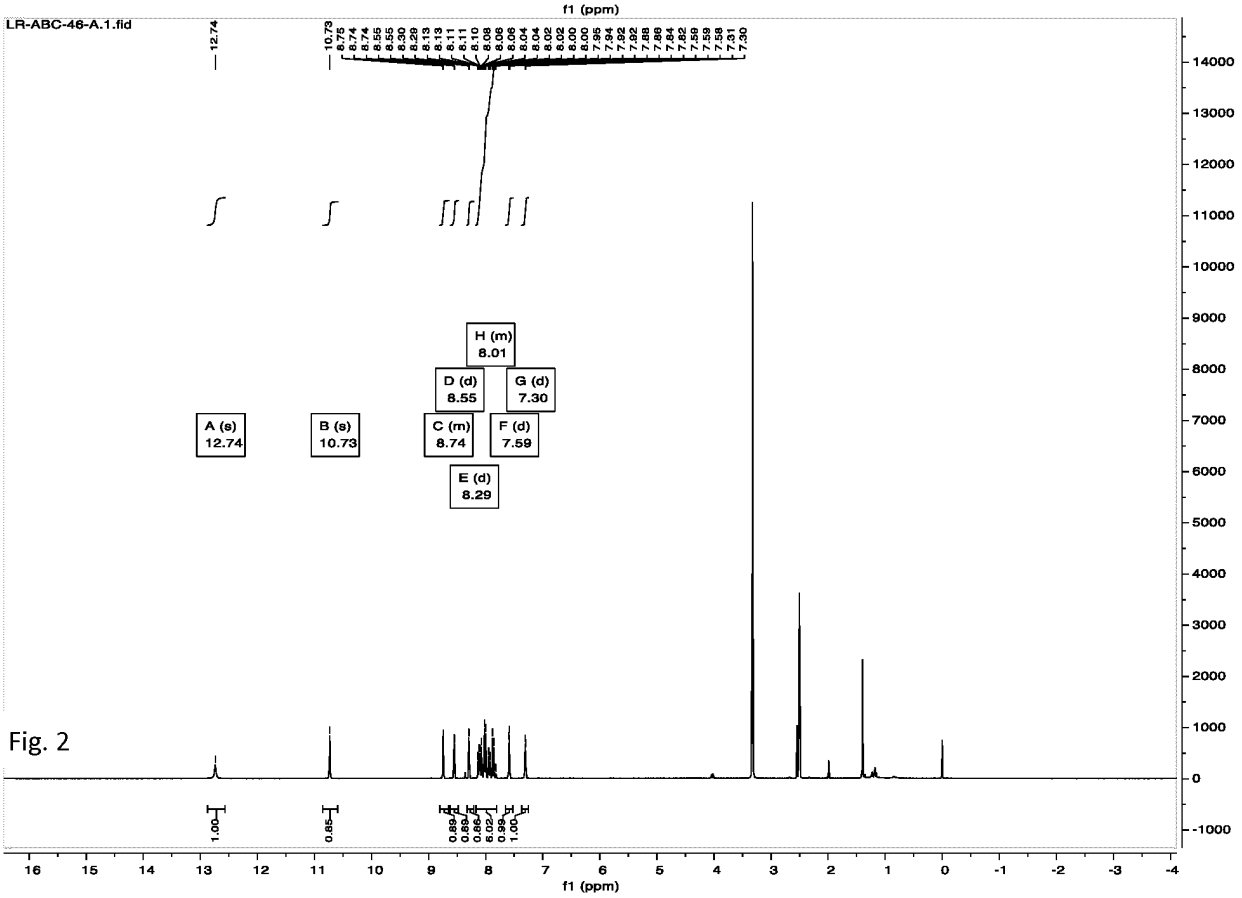

LR-ABC-46-A.1.fid
A (s) 12.74
B (s) 10.73
C (m) 8.74
D (d) 8.55
E (d) 8.29
F (d) 7.59
G (d) 7.30
H (m) 8.01
f1 (ppm)

Fig. 2

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2017/079856

A. CLASSIFICATION OF SUBJECT MATTER

A61K 31/165 (2006.01) i; C07D 213/56 (2006.01) i; A61P 35/00 (2006.01) i
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A61K; C07D; A61P

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNABS, DWPI, STN: 萘酰胺, 萘, 酰胺, 萘二酰胺, 癌, 肿瘤, naphthlamide, naphthalene, amide, cancer, tumor

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 104448897 A (HENAN NORMAL UNIVERSITY), 25 March 2015 (25.03.2015), description, paragraph [0057]	1-7, 10
A	CN 102603712 A (CHEN, Ye et al.), 25 July 2012 (25.07.2012), claims 1-7	1-10
A	CN 102295635 A (LIAONING UNIVERSITY), 28 December 2011 (28.12.2011), claims 1-8	1-10
A	WO 2015124101 A1 (SHANGHAI INSTITUTE OF MATERIA MEDICA, CHINESE ACADEMY OF SCIENCES), 27 August 2015 (27.08.2015), claims 1-10	1-10
A	WO 2013007184 A1 (CHEN, Ye), 17 January 2013 (17.01.2013), claims 1-8	1-10
A	WO 2010139180 A1 (CHIPSCREEN LTD. et al.), 09 December 2010 (09.12.2010), claims 1-13	1-10

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
14 December 2017	05 January 2018
Name and mailing address of the ISA State Intellectual Property Office of the P. R. China No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088, China Facsimile No. (86-10) 62019451	Authorized officer LI, Lin Telephone No. (86-10) 62413771

Form PCT/ISA/210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2017/079856

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN 104448897 A	25 March 2015	CN 104448897 B	08 June 2016
CN 102603712 A	25 July 2012	None	
CN 102295635 A	28 December 2011	WO 2013007184 A1	17 January 2013
		CN 102295635 B	09 October 2013
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		AU 2010256246 A1	12 January 2012
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		EP 2439195 B1	16 July 2014
		DK 2439195 T3	22 September 2014
		AU 2010256246 B9	30 January 2014
		ZA 201109030 B	27 February 2013
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		WO 2010139180 A8	05 January 2012
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Form PCT/ISA/210 (patent family annex) (July 2009)